

Talking Points for Edison Electric Institute's 2007 Fall Legal Conference
Silverado Resort, Napa
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Incenting Smart Grid Technologies

Introduction

Thank you very much for inviting me to speak at your fall legal conference. The Edison Electric Institute is an important forum for our ongoing energy dialogue. I am enjoying my new found profession as a Commissioner and have found that my training as a securities lawyer and law professor has yielded dividends. I also want to thank Governor Arnold Schwarzenegger for his leadership and ingenuity. He has fostered a climate of energy innovation in effectively addressing the investment and economic opportunities available in reducing climate change. I am honored as a CPUC Commissioner to be at the cutting edge of this effort. I would also like to thank Bruce Foster for the invitation and support. Bruce helped make my transition as Appointment Secretary to Commissioner manageable.

I am here today to share my thoughts on four very important topics that I have immersed myself in since joining the Commission:

- Smart Grid
- Energy Efficiency and Demand Response
- Renewable Energy
- Energy and Economic Development in the Green Economy

I will begin this morning by discussing the importance of a smart grid, the progress the CPUC has made in its advanced metering initiative (AMI), and where the state needs to go to transition to state-of-the-art grid infrastructure.

Incenting Smart Grid Technologies

The frequency of blackouts in San Francisco seem to occur more often than average due to a combination of high power demand and an aging infrastructure. I have requested data from PG&E to further examine this phenomenon. Now that my neighbors know I am a PUC Commissioner, they seem to think that I have a switch in my home that can magically restore power. Unfortunately, the solution is not that simple, which is why building smart grid

infrastructure and deploying state-of-the-art grid technologies is such a pressing topic for discussion.

The current electric distribution system in the United States is decades old. Power outages are causing increasingly great economic losses for the nation. According to the Lawrence Berkeley National Laboratory, about \$80 billion in economic activity is lost annually due to power outages. The Electric Power Research Institute estimates North America must invest an additional \$50-\$100 billion over the next ten years to bring the grid up to par. Additionally 60% of all power infrastructure will need to be replaced in the next 10-15 years to maintain the grid at the status quo. How did this come about? The short answer is that our grid is very old and has not received significant investment for the last 25-30 years. For example, 70% of transmission lines are 25 years or older, 70% of transformers are 25 years or older, and 60% of circuit breakers are more than 30 years old. Smart grid upgrades will not only replace aging infrastructure, but will deploy state-of-the art communication technologies that will allow the grid to interact with customers in real-time and adjust loads throughout the system in order to meet demand, thus obviating the need for new power plants.

Clearly, there is an opportunity in this country to replace old grid technologies with “smart” applications that can communicate with customers and the utility. This ultimately will reduce load and our fossil fuel consumption. The Commission recognized that smart meters are the first step to achieving a smart grid and in 2002 started to develop demand response and advanced metering policies. In 2004, the Commission established three minimum regulatory requirements for approval of the Advanced Metering Infrastructure, or “AMI” project proposals.

These regulatory requirements include:

- AMI systems must meet six minimum functional requirement criteria
- AMI project proposals must be cost-effective
- IOUs must provide a comprehensive plan for implementing their AMI projects, including AMI deployment and system integration

I would like to take a moment to discuss the six functional requirements of an AMI system:

1. Capable of supporting various price responsive tariffs

2. Capable of collecting energy usage data at a level that supports customer understanding of hourly usage patterns and their relation to energy costs
3. Capable of allowing access to personal energy usage data such that customer access frequency did not result in additional AMI system hardware costs
4. Compatible with applications that provide customer education and energy management information, customized billing, and complaint resolution
5. Compatible with utility system applications that promote and enhance system operating efficiency and improve service reliability
6. Capable of interfacing with load control communication technology

Since 2004, all utilities have filed applications to study or deploy advanced meters. The Commission has approved PG&E and SDG&E's requests and is in the process of reviewing Edison's request.

There are three key policies drivers for the Advanced Metering Initiative in California.

- First, in 2003, the CPUC and the California Energy Commission established a loading order for California of preferred energy resources. Demand response is second in the loading order after energy efficiency. Thus, demand response is a very high priority resource in California.
- Second, the Commission has set demand response goals that direct utilities to achieve 5% of system peak from demand response resources by 2007, which is approximately 2,500 megawatts. Today the utilities have approximately 900 megawatts of demand response, which demonstrates the need for advanced meters to tap into new market opportunities to meet these ambitious goals.
- Third, the Energy Action Plan articulated the need to transform California's investor-owned utility distribution network into an intelligent, integrated network enabled by modern information and control system technologies.

To give you an idea of what our advanced metering initiative looks like, here is a current update on the progress of each investor-owned electric utility.

- For Pacific Gas and Electric, the Commission approved a budget for \$1.74 billion dollars to retrofit 5.1 million electric meters and 4.2 million gas meters by 2011. PG&E has currently installed 110,000 meters and plans to install about 242,000 by the end of 2007. PG&E, unlike the other utilities, is using a proven technology that meets the

CPUC's minimum functional requirements, but does not have the full range of communication capabilities that are available in the marketplace today. Unlike the other utility proposals, PG&E's meter retrofits the old meter instead of replacing it. Next month, PG&E plans to file another application requesting more funds to upgrade their electric meters with communication capabilities similar to the other utilities.

- The Commission approved San Diego Gas and Electric's application last April for \$572 million to install 1.4 million solid-state electric meters and 900,000 gas meters. These new solid-state meters will replace old mechanical meters. SDG&E is currently selecting their technology and vendor through a competitive request for proposal. SDG&E will select a vendor by the end of the month and will seek Commission approval to roll out the program next September, with a two and half year deployment time period.
- Southern California Edison submitted their advanced metering application last July and the Commission is currently reviewing their request. Edison has requested \$1.7 billion to install 5.3 million solid state electric meters that will replace the old mechanical meters, similar to SDG&E. Edison is looking at a 4 year deployment time period, from January 2009 to December 2012.

While the advanced metering initiative will cost ratepayers billions of dollars over the next 5 years, each utility had to demonstrate that the benefits outweighed the costs in order to receive Commission approval. In addition, these infrastructure upgrades have great economic benefits, including but clearly not limited to creating thousands of jobs in California.

Looking forward, I believe this Commission needs to look beyond smart meters and transition our old grid to a state-of-the-art, twenty-first century transmission and distribution system. Modernizing our grid is essential if California, as Governor Arnold Schwarzenegger refers to as our nation state, or the world's eight largest economy, is going to remain a leader in the global economy. The state and electric industry need to work together and form public-private partnerships to determine which technologies are emerging or available in the marketplace today. We need to determine which ones are the most cost-effective, and which ones we need to deploy in order to meet this state's population and electricity growth. We need to keep our businesses competitive by minimizing outages and promote integration of intermittent renewables or distributed generation in order to meet our environmental goals and reliability needs. My vision is to help lead this transition in a comprehensive and well-

thought out manner that takes a long-view on where we are today and where we need to be if we are going to continue providing reliable electricity services that exploit clean energy sources.

As for additional steps to promote smart grid development and deployment, regulators should investigate what types of financial incentives can be provided to companies who undertake the development of smart grid technology. Since there is a degree of risk inherent in new technology, any returns on the investment that can be offered will impact the degree of capital outlay. Yet the concept of financial incentives is more than just minimizing risks. The regulators will want to look for smart energy technologies that have ratepayer benefits such as improved energy reliability and efficiency, as well as environmental benefits in the form of emissions reductions.

Regulators have been asked to consider decoupling profits from electricity sales. Utility companies have argued that utility ratemaking sets pricing and revenues on the basis of cents per kilowatt hour. Thus there is a reluctance to utilize new technologies because of the potential reduction in the amount of energy sold. With decoupling, the regulatory agency can eliminate the disincentive towards energy efficiency or other demand-side management technologies. California instituted decoupling in the 1970s and has benefited greatly from this policy decision.

Energy Efficiency

On the subject of energy efficiency, the Commission has made considerable progress in the last year. The Commission recently approved a risk/reward incentive mechanism for energy efficiency that creates a powerful incentive for top utility management to value energy efficiency equally to power plant development as they make future investment decisions. Utilities can earn up to \$450 million if they surpass the Commission's energy efficiency goals. On the other hand, the utilities can be penalized up to \$450 million if they do not meet the minimum performance standards. In lieu of this recent measure, I have directed the utilities to produce a corporate culture that rewards efficiency through compensation and other competitive employee incentives.

Energy efficiency and demand response equate to financial literacy and wealth management, saving consumers millions of dollars each year in energy costs. Through energy efficiency

and demand response education, consumers have the ability to reduce their energy load, and increase their income. Through this process we empower ratepayers through informed usage of energy sources.

Renewable Energy

Last year the California legislature accelerated the Renewables Portfolio Standard, or RPS, to 20% renewable energy by 2010, making it the most ambitious in the country. The Investor Owned Utilities have made significant progress in the past few years in reaching this goal and will have 20% of their electricity contracted by 2010, and delivered by 2011 or 2012.

The RPS has created a robust market for renewable energy and has led to construction of new renewable generation through competition and a level-playing field. While we have made significant progress increasing the generation of renewable energy in the state, we still face a few very important challenges, which include transmission, grid integration, and technological innovation. I imagine that your states share these same challenges.

Because renewable resources are often located far from population centers and existing transmission infrastructure, new transmission lines must be built to access these resources. I support creative and collaborative initiatives to build new renewable transmission in the most cost-effective manner. For example, the CPUC is an active leader in the newly-formed Renewable Energy Transmission Initiative, which is a statewide planning process that will identify the most cost-effective transmission projects needed to accommodate the state's renewable energy goals. This approach is modeled after the Texas approach to identifying competitive renewable energy zones.

Grid integration of intermittent renewables is also becoming a challenge as we ramp up renewable energy procurement. We need a new paradigm and much creativity regarding how we think about the grid. Our grid was built for fossil-fuels such as coal, oil, and gas, or base-load power, such as nuclear. In order to shift towards low-carbon fuels, we need to procure more renewables and flexible fossil fuels that can complement the intermittent nature of some renewable resources.

We also need to think creatively. For example, two weeks ago, PG&E and Tesla Motors announced a new partnership to explore smart charging. Instead of providing power back to

the grid, smart charging remotely controls the vehicle charging rate to support the operation of the grid or best match load to the availability of intermittent renewable energy resources such as wind and solar. I applaud PG&E and Tesla for this bold step in energy conservation and grid management. Only through creative thinking and entrepreneurship will we be able to achieve a low-carbon future.

In order to meet the state's ambitious climate change goals, we will also need technological innovation on a large scale. The Commissioner is currently reviewing various programs that would use ratepayer funds to support emerging renewable research, development, and demonstration programs.

Jobs and the Green Economy

I also strongly believe in the opportunity this new energy economy affords our state for economic development and jobs for all communities in California. On January 14th of next year, I will be spearheading a conference in conjunction with the Willie Brown Institute titled "Advancing the New Energy Economy in California: Summit on, long-term investment, green jobs and financial growth."

This conference will bring together investors, political leaders, industry experts, and labor leaders to advance long-term investment, job creation, and financial growth within the green technology sector. Key figures will articulate the challenges and solution strategies for diversified, continuous expansion of green business and technology in California. This conference is not intended to be a one day experience, but rather the beginning of a dialogue to bridge the gap between the investor community and the green economy workforce to ensure that all communities can benefit from these new economic development opportunities.

There is much more I can say about this topic and the others that I have covered, but understanding that we have convened in California's luscious wine country, I will not place any additional strain on our internal smart grid. I will stop now and give you the opportunity to ask a few questions. Thank you.